Water Conservation in New Mexico

New Mexico always has had periods of water shortages, some far more long-lasting and devastating than others. As the state’s population and water demand continue to increase, the likelihood that water shortages will occur with greater frequency and cause significant economic and environmental harm will increase as well unless we improve our water management significantly.

Water Conservation as a Strategy to Meet Growing Demand with Available Supply

When demand exceeds available water supply, there are two options to close the gap between supply and demand: we can find new water sources, or we can reduce demand. For many decades, New Mexicans have been acquiring new water sources and developing new methods of accessing and increasing water supply: constructing dams and reservoirs, drilling ever deeper, pumping groundwater over long distances, desalination, and other means. Continuing this search for the remaining unclaimed water sources will be more expensive, energy intensive, and environmentally challenging than before.

Reducing water use – conserving water – on the other hand increases the available water supply. Every gallon saved is a gallon that doesn’t have to be found elsewhere. It is also relatively inexpensive. Thus water conservation can go a long way toward ensuring that a community has enough water to meet demand.

This seemingly obvious goal of reducing water use is complicated by the “use it or lose it” doctrine of western water law and many complex hydrologic challenges, particularly in the agricultural sector of water use.

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Current Statutes – History
Because New Mexico focused on meeting demand by finding and accessing new water supplies for much of New Mexico’s history, it wasn’t until the 1980’s that incentives for water conservation began to appear in state statutes. Even then the first changes were in response to litigation, not water shortages.
In 1983, New Mexico’s statutory prohibition against out-of-state transportation of ground water was declared unconstitutional. The court in *City of El Paso v. Reynolds*, applied the U.S. Supreme Court’s holding in *Sporhase v. Nebraska ex rel. Douglas* that a Nebraska statute prohibiting withdrawal and transportation of Nebraska’s water by another state placed an impermissible burden on interstate commerce. The *Sporhase* court, however, upheld a state’s right to base decisions regarding exportation of water resources on conservation and public welfare considerations. A state has the right to protect the health and well-being of its citizens as long as that right does not rely primarily on economic concerns.
In 1985 in response to the court’s ruling, the New Mexico legislature amended several statutes in the water code to mandate that the State Engineer consider whether applications for water rights are

### Legislative History of Water Conservation Statutes

**1985**
The statutes governing water were amended to require that applications for new appropriations and transfers be denied if they are “contrary to the conservation of water within the state or detrimental to the public welfare of the state.” N.M. Stat. Ann. §§72-5-5, 72-5-6, 72-5-7, 72-5-23, 72-12-3, and 72-12-7

A new statute was enacted to provide standing for those asserting legitimate concerns “involving public welfare and conservation of water.” N.M. Stat. Ann. §72-5-5.1

**1987**
The state’s regional water planning program was enacted with the requirement that regional water plans include an “adequate review of water conservation and the effect on the public welfare.” N.M. Stat. Ann. §72-14-43 and §72-14-44

**1991**
The forfeiture statutes were amended to add subsections that provided an exception from the forfeiture statute for water rights placed in a state engineer-approved water conservation program by conservancy districts, acequia or community ditch association or irrigation district. N.M. Stat. Ann. §§72-5-28 and 72-12-8

**1995**
The Subdivision Act was amended to include a requirement that county boards of supervisors adopt regulations setting forth requirements for water conservation. N.M. Stat. Ann. §47-6-9

**1999**
The Ground Water Storage and Recovery Act was enacted to promote the conservation of water within the state by recharging aquifers. N.M. Stat. Ann. §§72-5A-1 et seq.

**2003**
The water leasing statute was amended to require that applications for leases of water be denied if they are “contrary to the conservation of water within the state.” N.M. Stat. Ann. §72-6-5

The Water Project Finance Act added water conservation projects as qualifying projects for applicants seeking grants or loans from the Water Trust Board. N.M. Stat. Ann. §72-4A-1 et seq.

The State Water Plan Act included a requirement that the plan “devel-
contrary to the conservation of water within the state.” Significantly, these criteria apply to all new appropriations and transfers, not just to interstate transactions.

Two years later, in 1987 – also in response to the El Paso ruling – the legislature enacted two statutes creating the regional water planning program. The intent was to identify those water supplies that had not already been appropriated and protect them from interstate transfers as well as to bolster the state’s ability to keep water in New Mexico by demonstrating that the water was needed for the conservation of water and protection of the public welfare within the state.

It was only in 1995 and subsequent years that the legislature began to amend or create new statutes to:

- protect water conserved by farmers;
- provide a basis for the Groundwater Storage and Recovery Act;
- ensure that conservation was part of the State Water Plan;
- require counties to adopt water conservation requirements for subdivisions;
- include water conservation projects as qualifying for funding from the Water Trust Fund;
- require water conservation plans; and
- authorize grey water reuse.

The Water Quality Act was amended to allow up to 250 gallons of gray water a day to be used on residential landscaping. N.M. Stat. Ann. §74-6-4

The statute regarding irrigation water was amended to clarify that “[I]mproved irrigation methods resulting in conservation of water shall not affect an owner’s water rights or quantity of appurtenant acreage.” N.M. Stat. Ann. §72-5-18

A new statute authorized municipalities and counties to require that site development standards encourage conservation of water. N.M. Stat. Ann. §3-53-2.1

op water conservation strategies and policies; to maximize beneficial use, including reuse and recycling by conjunctive management of water resources and by doing so to promote non-forfeiture of water rights.” N.M. Stat. Ann. §§72-14-3.1 et seq.

A water planning statute was enacted to provide that covered entities (municipalities, counties and water suppliers which provide at least 500 acre-feet of water annually for domestic, industrial, commercial or governmental uses) may submit water conservation plans. It also required that the covered entity’s plan consider adoption of codes and ordinances to encourage water conservation measures and drought contingency planning. N.M. Stat. Ann. §§72-14-3.2 and 4-37-9.1

2007

The statute regarding irrigation water was further amended to add language that would enable the state engineer to approve a water rights transfer (a change in the point of diversion or place or purpose of use) of the quantity of conserved agricultural water resulting from improved irrigation or agricultural practices, provided that the conservation has not resulted in impairment to existing water rights. N.M. Stat. Ann. §72-5-18

A new statute authorized municipalities and counties to require that site development standards encourage conservation of water. N.M. Stat. Ann. §3-53-2.1
The ABC’s of Water Use and Conservation

There are several distinctions between different forms of water use that impact whether or not water is considered to have been conserved. The following discusses some of those distinctions.

The Office of the State Engineer issues a report on water withdrawals by category (agriculture, public water supplier, commercial, etc.) every five years. Withdrawals include both water that is “consumed” and water that remains in the system to be used again or sent downstream to meet interstate delivery requirements.

*Consumptive* water use means that after the water is used, it is no longer available. Most often consumptive use of water occurs through absorption by and evaporation from plants including landscaping, crops and riparian vegetation (*evapotranspiration*) or evaporation from open water in ponds, rivers, and reservoirs or from moist soils (whether due to precipitation or irrigation). The loss of water from the system is also called a *depletion*.

Water that has been *diverted* but not consumed remains in the system. Very little water is consumed for indoor domestic uses, for example, much of it goes to waste water treatment plants. Often waste water or treated effluent is reused or returned to the river where it becomes available for reuse downstream. Likewise, more water is diverted to deliver water to crops than is consumed by the crop; the excess water returns to the stream or underground aquifer.

Agricultural water rights are divided into several components. The *consumptive irrigation requirement* (CIR) is the amount consumed by the plant and the amounts evaporated from the plants or the soil surfaces near the plant. The consumptive use is the only element of a water right that can be sold or leased for non-agricultural uses.

A farmer also has a *farm delivery requirement* (FDR) which is the amount needed to get water to the field; it is ultimately returned to the stream system to be used downstream, minus some incidental losses to leakage or evaporation. The FDR cannot be sold as part of a water right for non-agricultural purposes.

Developments in Water Conservation

Water conservation opportunities are recognized in municipal, commercial, industrial agricultural, riparian and open water environments. Of these, municipal conservation is the most discussed and easily implemented. Ways to conserve water in agriculture are less understood, less easily implemented, or more costly. Other opportunities for conservation in riparian areas and storage reservoirs are beyond the scope of this paper.

Municipal Water Conservation

Urban water use is rising in New Mexico as population increases. Population projections indicate that demand will increase dramatically into the future. The New Mexico population as counted in the 2000 census was 1,819,046. A recent population projection by the Bureau of Business and Economic Research estimates that there will be 2,540,145 people in New Mexico in 2020 and 3,710,875 in 2060. The fastest growing regions are those in and around the major urban centers particularly in the middle and lower Rio Grande regions.
Residential municipal water use is divided into two components: indoor use and water used outside for landscaping. Most water used indoors is not “consumed” but flows into waste water treatment systems and is reused, returns to a river, or recharges groundwater. Indoor use is concentrated in the bathroom. In particular, water use by older toilets is typically the largest source of indoor water use. Installing a highly efficient or ultra low-flow toilet and other water efficient fixtures can reduce average indoor water use by about 35 percent without any change in lifestyle. In addition, many communities are changing their rate structures to tiered or block rates, charging customers more for excessive use, in order to encourage water conservation.

Water used outdoors for landscaping is consumed by plants and evaporation. Outdoor water consumption is a large proportion of residential water use which ranges from 19 percent in Tucson, Arizona to 51 percent in Las Vegas, Nevada. The percentage in Albuquerque is 27 percent. Water conserving landscapes can save significant amounts of water. Savings can be accomplished by landscaping design and plant selection, and watering practices. In some areas, studies have shown savings ranging from 42 to 57 percent. These savings are significant, because water for urban landscaping is usually completely lost to the system.

Water withdrawals by industrial and commercial entities – generally in urban areas – totals less than two percent of total water withdrawn. Both uses of water and conservation opportunities vary widely. There have been important conservation efforts in these sectors as well.

Some of New Mexico’s larger communities with utilities have been successful in implementing water conservation programs. The two most successful have been Santa Fe and Albuquerque. The results from the City of Santa Fe’s toilet retrofit program have been dramatic; it has stabilized the city’s water production at amounts less than 10,500 acre-feet per year from 2004 to the present despite an annual growth rate of 1.7 percent. In addition, Santa Fe’s gallons per capita per day (gpcd) use has dropped from 168 gpcd in 1995 to 100 gpcd in 2009. Albuquerque began its water conservation effort in 1995 when its water use was 252 gpcd; by 2009, that number had been reduced to 159 gpcd.

Gallons per Capita per Day

Measuring municipal conservation efforts has become increasingly important for several reasons. Conservation measures – such as retrofits of fixtures and landscaping – cost money. In order to evaluate and justify the costs, it is important to understand the results. Measurement of conservation progress has also become increasingly important as the state engineer has begun to condition permit approvals on meeting water conservation goals (based on the 1985 amendments requiring that usage not be contrary to water conservation). Finally, based on statutory changes, water plans and applications for funding now give greater emphasis to water conservation measures.

Municipal water use is measured as gallons per capita per day (gpcd), which is a common tool for water use reporting. Until recently, however, there was no standardized method for calculating gpcd in New Mexico. In 2009, the Office of the State Engineer developed a standardized method for calculating gallons per capita per day. A number of cities and utilities now use the new standard, but it is not yet universal. The methodology will be used by the OSE to track municipal use over time and aid in planning and projecting future per capita needs.
Agricultural Water Conservation

In 2008, the Office of the State Engineer quantified the amount of water withdrawn for irrigation agriculture as 77.86 percent of total withdrawals between 2000 and 2005. Because such a high percentage of water is withdrawn for agriculture in New Mexico, one might expect that significant resources would have been committed to agricultural water conservation. Efforts to promote agricultural water conservation legislatively, however, have so far not been seen as effective.

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As the adequacy of New Mexico’s water supply emerged as a concern, considerable attention was focused initially on the state’s forfeiture statutes also known as “use it or lose it” which created a disincentive to save water. New Mexico’s constitution and water code base a water right on the beneficial use of that water. Water must be put to a beneficial use and cannot be saved and used at a later time. If the water right holder fails to use that water for at least four years, the water right is subject to forfeiture. Abandonment may also occur, but requires a longer period of non-use and proof of an intention to abandon the water right. In either case, there has been a legal disincentive to save or conserve water.

Municipal demand is increasing and most cities or private utilities serving residential needs are trying to find ways to meet demand, so the “use it or lose it” provisions are not so problematic. Moreover, there is a statute that provides protection for a 40-year period for municipal water rights that are obtained to meet future needs provided they have an approved water development plan.

In the agricultural sector, the “use it or lose it” doctrine creates some obstacles to water conservation. There have been several efforts to protect conserved agricultural water. In 1991, two statutes were amended to provide a limited exception from forfeiture for water in approved conservation programs; to date, no conservation program has been approved pursuant to these legislative changes. In 2003, an additional amendment was made to the statute governing amounts allowed for agricultural water use to provide that conserved water from improved irrigation methods remained as part of an owner’s water right.

While these amendments did eliminate the legal “use it or lose it” disincentive to conserve water, they did not clarify the complex technical issues related to agricultural water conservation or address financial incentives to promote water conservation. In 2007, a second amendment was enacted that was meant to create a financial incentive for farmers to conserve water by enabling them to sell (or change the location or use of) the conserved water provided that there would be no impairment of other water rights. As of yet, there have been no applications to approve any transfer of water pursuant to this provision, in large part because of the findings of recent studies.

A House Joint Memorial in 2009 requested that NMSU conduct a study of agricultural water use methods that could make water available to other users. The study found that better irrigation methods improved the ability of crops to utilize water, thereby increasing water consumption and crop yields rather than
decreasing water use, a result that confirmed what the Office of the State Engineer and others had been saying for some time.

The concern is that if “conserved” water was not being “consumed” previously, and then is transferred to a new consumptive use, the overall consumptive use (or depletion of a stream) is increased. Consequently, New Mexico has yet to implement active agricultural water conservation programs that would free up water for other uses.

Since only water that was previously consumed and subsequently conserved can be transferred to a new consumptive use, the opportunities for benefits to farmers if they conserve water without entirely ceasing irrigation are limited. Consequently, it may be that the best opportunities for agricultural water conservation may be in reducing the losses in delivering water to the crop, rather than in reducing the actual amount of water consumed by the crop. However, even this could require distinguishing between water that was being “consumed” (evaporation, for example) and water that remains in the system by returning to a river or other water source.

To complicate matters, the benefits of agricultural water conservation vary depending on crop, soil types and location. What may benefit one farmer may not benefit another. In addition, some agricultural water conservation measures may cause harm, for example, seepage may be important to people who live nearby and ditches in many old acequia systems support cottonwood stands and wetlands that few want to lose.

The state has worked with the agricultural community to develop a list of conservation measures such as laser leveling of fields, drip irrigation, more effective head gates, etc., and there is some limited funding to support these measures. Some incentives to conserve exist already. For those farmers relying on pumped groundwater, using less water results in reduced energy costs. In water short years, prevention of incidental depletions enables the farmer to use that water for their crops. And in a closed groundwater aquifer, increasing the longevity of the aquifer may be sufficient to justify more conservation than less.

But many conservation measures cost money. Even the cost of metering water use – a first step toward water conservation – may be too costly for many small farmers. Farmers argue persuasively that they should not be required to bear the financial burden of conservation measures without some benefit in return such as increased profits, tax incentives, or cost-sharing provisions.

Water Conservation Issues

At least since 1976 when the “New Mexico Water Resources Assessment for Planning Purposes” was issued, the assumption was that increased needs for municipal, industrial, and other uses would be met by the retirement of irrigated agriculture. Indeed, it has been common for state engineers to say that a reduction of 10 percent of agricultural water use would be enough to meet the growing demands of cities and, in fact, municipalities and
developers have been buying agricultural water rights for years. That assumption is now being challenged on several fronts. People value both agriculture and the open space and the green belt that agriculture provides. More recently there is growing concern about access to locally grown food and future food security. In addition, the idea that it would only take retirement of a relatively small amount of agricultural land to meet increasing demand may be an illusion, at least for the middle Rio Grande.

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There are currently permits for about 230,000 acre-feet per year of groundwater pumping in the middle Rio Grande valley that require offset of the impacts of the pumping on the surface water in the Rio Grande. Offsets can and are made using a combination of return flow credits, vested groundwater rights, San Juan Chama water, and acquired senior water rights (pre-1907 rights). Pumping impacts on the river lag behind the amount of pumping, but in general, the amount of the required offsets will increase over the long-term as groundwater pumping increases. Assuming that the full 230,000 acre-feet will be pumped in the future (current pumping under the permits is on the order of 110,000 acre-feet per year and temporarily dropping as the Albuquerque Bernalillo County Water Utility Authority goes to full operation of its surface water treatment plant) and assuming that the required offset, when it is needed, will consist of a combination of about 50 percent return flow credits and 50 percent purchased pre-1907 water rights; then, approximately 55,000 acres of pre-1907 water right lands would need to be fallowed. Given that the total amount of irrigated land within the Middle Rio Grande Conservancy District, the primary source area for pre-1907 water rights in the middle valley, is between 50,000 and 65,000 acres; only about 10,000 acres of the current land being farmed would be left with water rights. That assumes all the currently irrigated MRGCD lands are pre-1907 water rights lands which we know is not true. In any case, the character of the middle Rio Grande valley would be significantly different than exists today. It should be emphasized that the above hypothetical analysis is only for the middle Rio Grande and that vested rights and imported water will likely provide a portion of the required future offsets. Nonetheless, the analysis provides insight into the types of land use changes that will occur in the future. Additionally, senior surface water rights that are being transferred in the upper Rio Grande and Lower Rio Grande are not part of the analysis.
Municipal water conservation is making a difference. Larger utilities can afford to make an investment in conservation measures. But municipal water conservation is more problematic in small rural communities because they have fewer resources. Conservation efforts cost money, although they are almost always cheaper than purchasing or otherwise accessing new water supplies.

Many communities rely on groundwater, and water tables are falling, especially in areas where there is little or no recharge. Unless the rate of groundwater depletion is slowed, more and more areas will find themselves without any groundwater at all. These communities especially need support for water conservation measures. Even those communities with active conservation programs must protect groundwater supplies from further depletion in order to retain groundwater as a drought reserve.

Finding enough water is getting harder, making conservation a more desirable and necessary option. Conservation of water results in more water available into the future.

Next Steps

There are a number of steps that New Mexico could take to promote water conservation.

Information on water demand and supply is critical. Without measurements and data on water supply and demand, a community has no way of knowing if the gap between supply and demand is a threat in the near future or not for several decades, nor can a community justify the costs of promoting conservation without an adequate showing of the benefits. Moreover, to protect conserved water, that water must be measured.

A small amount of funding to the Office of the State Engineer’s Water Use and

Conservation Bureau would go a long way: for design of research on the best avenues for conservation, providing conservation information to the public, and developing model conservation ordinances. The Water Use and Conservation Bureau could more effectively develop and help implement the conservation component of the state water plan, providing assistance to small communities with minimal staff and resources.

Agricultural water conservation remains elusive. The Office of the State Engineer has cautioned that allowing practices that some see as viable water conservation efforts, but which could, without adequate measuring and monitoring, reduce the amounts available to meet the needs of senior water rights owners, interstate stream compact delivery requirements and endangered species. New Mexico must resolve whether or not agricultural conservation is possible and if so, decide what is allowable. New Mexico should not wait for the next big water supply crisis before this issue is resolved.

Unfortunately, given current economic conditions, the greatest need is funding to support conservation efforts where there are inadequate or no financial resources. Conservation in many communities may only happen with state and federal financial support; the legislature needs to determine which, if any, conservation measures should or could be funded by the state.

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Sources Consulted and Other Contributors


Office of the State Engineer, Gallons per Capita per Day Methodology, see http://www.ose.state.nm.us/wucp_gcpd.html.


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